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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NOLAN, PETER D	

ART UNIT	PAPER NUMBER
3661	

MAIL DATE	DELIVERY MODE
12/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,745	LEGNER, JURGEN	
	Examiner	Art Unit	
	Peter D. Nolan	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7/1/2009* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The amendment to the claims filed 7/1/2009 has been received. Claims 12-23 have been canceled. New claims 24-33 have been entered.

All previous rejections of the claims have been rendered moot in light of the amendment.

The amendment to the specification filed 7/1/2009 and the drawing filed 7/1/2009 have been entered.

Examiner acknowledges the support for newly added drawing (with the exception of the objection below) as pointed out by Applicant in the response filed 7/1/2009.

Response to Arguments

Applicant's arguments filed 7/1/2009 have been fully considered but they are not persuasive.

Applicant asserts that the prior art fails to discuss the arrangement of the clutch in relation to the torque converter.

Examiner respectfully disagrees. In paragraph 7 of the specification, Applicant states "In work machines such as wheel loaders, on one hand, a driving motor drives the driving wheels *via a hydrodynamic torque converter and a clutch device*". In addition, "at the beginning of the loading operation, the driving clutch is opened upon actuation of the service brake" and that "without this control function a very high power loss develops in the torque converter when the drive is connected and the vehicle service brake is actuated, since the turbine wheel in the converter has come to a

complete or nearly complete halt, while *the pump wheel, driven by the driving motor*, rotates at the stall speed." It is clear that the clutch device is situated between the drive and the turbine wheel of the torque converter (i.e. output) because the pump wheel of the torque converter (i.e. input) is driven by the driving motor. This is a conventional automatic transmission.

For further reference, see Mikami et al. (US 6039673) column 1, lines 10-54 which describes the arrangement of the components of a conventional automatic transmission. Power is transmitted from the engine through the torque converter (hydraulic power transmission) and a speed change unit. A clutch is provided between the torque converter and the speed change unit and is used to disengage the drive from the torque converter when the vehicle is in a stopped state.

Applicant further asserts that the method of determining the output torque of a torque converter taught in Fonkalsrud is distinct to the method claimed in the present application because Fonkalsrud fails to teach giving consideration to the rotational speed of a hydraulic pump. In addition, Applicant asserts that the method in Fonkalsrud includes numerous additional steps and is therefore more complicated than the method claimed.

Examiner respectfully disagrees. Fonkalsrud teaches determining the output torque of the torque converter using, in part, the input speed and the output speed of the torque converter. These values correspond to the speeds of the impeller and the turbine of the torque converter, respectively (**see Fonkalsrud column 3, lines 42-62. See also figure 1 and column 1, lines 61-67**). As admitted by Applicant, the pump

used to drive the power consuming devices and the input of the torque converter are both driven by the engine. Therefore, the pump speed is the same as the input speed of the torque converter. Regarding Applicant's argument that the method in Fonkalsrud is more complicated than the method claimed, Examiner notes that the method as claimed does not preclude the additional steps in Fonkalsrud.

Applicant further asserts that Rieger is distinct from the current application as claimed because the method disclosed by Rieger is used in a vehicle that is traveling in a creep mode. In addition, Applicant asserts that Rieger fails to teach a number of the factors claimed in the application.

Examiner respectfully disagrees. Rieger teaches a method of disengaging a clutch based on the input torque of the clutch and a braking request (**see Rieger column 3, lines 13-22; column 4, lines 32-49; column 3, lines 30-35**) and is therefore applicable. Regarding Rieger failing to teach a number of the factors claimed in the application, Examiner respectfully requests that Applicant specifically point out which factors it fails to teach.

Drawings

The drawing submitted on 7/1/2009 is objected to because it contains new matter. Specifically, the connection between the electronic controller 20 and the power consuming device 14 was not described in the original specification nor illustrated in the original figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any

amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 24, 26, 27, 29, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art with reference to Mikami et al. (US 6039673) and in view of Rieger et al. (US 7025708 B2).

Regarding claim 24, Applicant's admitted prior art teaches a control device for controlling functions of a vehicle which has a drive motor connected to a hydraulic pump and to a hydrodynamic torque converter, which is connected to a clutch (**see Applicant's specification paragraph 7**), and the clutch is connected to the drive wheels of the vehicle (**see id. For further reference, see Mikami et al. column 1, lines 10-54 which describes the arrangement of the components of a conventional automatic transmission. Power is transmitted from the engine through the torque converter (hydraulic power transmission) and a speed change unit. A clutch is provided between the torque converter and the speed change unit and is used to disengage the drive from the torque converter when the vehicle is in a stopped state**), the control device comprising: a brake system (**see Applicant's specification paragraph 7**)

However, while Applicant's specification teaches where the clutch may be disengaged depending on the status of the braking system (**see Applicant's specification paragraph 7**) which would inherently require a device to detect braking, it does not teach where the system further comprises a brake system sensor which detects actuation of the brake system and issues a braking signal having a value that correlates to a strength of the braking actuation; and an electronic controller which determines an input torque of the clutch and disengages the clutch depending on the determined input torque of the clutch and the braking signal.

Rieger teaches where a device may comprise a brake system sensor which detects actuation of the brake system and issues a braking signal having a value that

correlates to a strength of the braking actuation (**see Rieger column 2, lines 39-46 and column 7, lines 4-6**); and an electronic controller which determines an input torque of the clutch and disengages the clutch as a function of the input torque to the clutch and a deceleration request (**see Reiger column 3, lines 13-22 and column 4, lines 32-49. See also column 3, lines 30-35 teaching where the input shaft of the clutch is connected to the output shaft of the engine because "the rotational speed differential across the clutch can be determined from the rotational speed differential between the engine shaft and the transmission input shaft". Therefore the input torque of the clutch is directly related to the output torque of the engine which is one of the parameters in Reiger (see column 2, lines 58-61). Regarding using an electronic controller, see Rieger column 4, lines 50-63**).

It would be obvious to one of ordinary skill in the art to modify the device in Applicant's admitted prior art with the controller in Rieger because this allows the clutch torque to be reduced at a high speed when there is danger of an engine stalling (**see Rieger column 2, lines 29-38**). Although the clutch in Rieger is for an automated manual shift transmission, the function of the clutch is the same as the clutch in Applicant's admitted prior art, i.e. disconnecting the driving motor from the driving wheels.

Regarding claim 26, Applicant's admitted prior art, as modified by Rieger in claim 26, teaches where the strength of the braking actuation is determined from one of a braking pressure and a position of a brake pedal (**see Rieger column 2, lines 39-46**).

Regarding claim 27, Applicant's admitted prior art teaches a method of controlling functions of a vehicle which has a drive motor connected to a hydraulic pump and to a hydrodynamic torque converter which is connected to a clutch, and the clutch is connected to the drive wheels of the vehicle (**see Applicant's specification paragraph 7. For further reference, see Mikami et al. column 1, lines 10-54 which describes the arrangement of the components of a conventional automatic transmission. Power is transmitted from the engine through the torque converter (hydraulic power transmission) and a speed change unit. A clutch is provided between the torque converter and the speed change unit and is used to disengage the drive from the torque converter when the vehicle is in a stopped state**).

However, while Applicant's admitted prior art teaches where the method further comprises disengaging the clutch (**see Applicant's specification paragraph** 7), it does not specifically teach where the method comprising the steps of detecting actuation of brake system with a brake system sensor which issues a braking signal having a value that correlates to a strength of the braking actuation; determining a input torque of the clutch with an electronic controller upon reception of the braking signal by the electronic controller; braking the vehicle upon recognition of the braking signal; and disengaging the clutch as a function of the determined input torque of the clutch and the value of the braking signal.

Rieger teaches a method of controlling functions of a clutch in a drive train that comprises the steps of detecting actuation of brake system with a brake system sensor

which issues a braking signal having a value that correlates to a strength of the braking actuation (**see Rieger column 2, lines 39-46 and column 7, lines 4-6**); determining a input torque of the clutch with an electronic controller upon reception of the braking signal by the electronic controller (**see Rieger column 2, lines 39-55**); braking the vehicle upon recognition of the braking signal (**see id**); and disengaging the clutch as a function of the determined input torque of the clutch and the value of the braking signal (**see Reiger column 3, lines 13-22 and column 4, lines 32-49. See also column 3, lines 30-35 teaching where the input shaft of the clutch is connected to the output shaft of the engine because "the rotational speed differential across the clutch can be determined from the rotational speed differential between the engine shaft and the transmission input shaft". Therefore the input torque of the clutch is directly related to the output torque of the engine which is one of the parameters in Reiger (see column 2, lines 58-61). Regarding using an electronic controller, see Rieger column 4, lines 50-63**).

It would be obvious to one of ordinary skill in the art to modify the method in Applicant's admitted prior art with the clutch control in Rieger because this allows the clutch torque to be reduced at a high speed when there is danger of an engine stalling (**see Rieger column 2, lines 29-38**). Although the clutch in Rieger is for an automated manual shift transmission, the function of the clutch is the same as the clutch in Applicant's admitted prior art, i.e. disconnecting the driving motor from the driving wheels.

Regarding claim 29, Applicant's admitted prior art, as modified by Rieger in claim 27, teaches where the method further comprises the step of associating a predefined braking signal with the determined input torque of the clutch and only disengaging the clutch when the value of the braking signal correlates to a value of the predefined braking signal (**see Reiger column 3, lines 13-22 and column 4, lines 15-19**).

Regarding claim 30, Applicant's admitted prior art, as modified by Rieger in claim 27, teaches where the method further comprises the step of the value to the braking signal being defined as a measure of a brake pedal path and a braking pressure (**see Rieger column 2, lines 39-57 regarding the value of the braking signal being determined from the pressure of the hydraulic braking system. See also column 1, lines 31-38 and column 7, lines 4-16 where the digital signal of the brake light switch is monitored for redundancy to determine whether there is a line interruption**).

3. Claims 25, 28, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art with reference to Mikami et al. (US 6039673) and in view of Rieger et al. (US 7025708 B2) and further in view of Fonkalsrud et al. (US 6560549 B2).

Regarding claim 25, Applicant's admitted prior art, as modified by Rieger in claim 24, does not teach where the electronic controller determines the input torque of the clutch from a rotational speed of the hydraulic pump, a rotational speed of a turbine

of the hydrodynamic torque converter and a characteristic rotational speed line of the hydrodynamic torque converter.

Fonkalsrud teaches a controller calculating the input torque to a transmission from the characteristics of a torque converter including: a rotational speed of the impeller to the torque converter, the rotational speed of the turbine of the torque converter and a characteristic rotational speed line of the hydrodynamic torque converter (**see Fonkalsrud column 3, lines 42-62 where a converter output torque is determined as: Converter Output Torque = Primary Torque*Torque Ratio*(Input Speed/Output Speed)^2. As admitted by Applicant, the pump used to drive the power consuming devices and the input of the torque converter are both driven by the engine. Therefore, the pump speed is the same as the input speed of the torque converter**).

It would be obvious to modify Applicant's admitted prior art, as modified by Rieger, so that the input torque to the clutch is calculated in the manner taught in Fonkalsrud because this would provide a more accurate value of the clutch input torque than the engine torque used in Rieger.

Regarding claim 28, Applicant's admitted prior art, as modified by Rieger in claim 27, does not teach where the method further comprises the step of basing the determination of the input torque of the clutch on a rotational speed of the hydraulic pump, a rotational speed of a turbine of the hydrodynamic torque converter and a characteristic rotational speed line of the hydrodynamic torque converter.

Fonkalsrud teaches a method of calculating the input torque to a transmission from the characteristics of a torque converter including: a rotational speed of the impeller to the torque converter, the rotational speed of the turbine of the torque converter and a characteristic rotational speed line of the hydrodynamic torque converter (**see Fonkalsrud column 3, lines 42-62 where a converter output torque is determined as: Converter Output Torque = Primary Torque*Torque Ratio*(Input Speed/Output Speed)^2. As admitted by Applicant, the pump used to drive the power consuming devices and the input of the torque converter are both driven by the engine. Therefore, the pump speed is the same as the input speed of the torque converter**).

It would be obvious to modify Applicant's admitted prior art, as modified by Rieger, so that the input torque to the clutch is calculated in the manner taught in Fonkalsrud because this would provide a more accurate value of the clutch input torque than the engine torque used in Rieger.

Regarding claim 33, Applicant's admitted prior art teaches a method of controlling functions of the vehicle which has a drive motor connected to a hydraulic pump and to a hydrodynamic torque converter which is connected to a clutch, and the clutch is connected to the drive wheels of the vehicle (**see Applicant's specification paragraph 7. For further reference, see Mikami et al. column 1, lines 10-54 which describes the arrangement of the components of a conventional automatic transmission. Power is transmitted from the engine through the torque converter (hydraulic power transmission) and a speed change unit. A clutch is provided**

between the torque converter and the speed change unit and is used to disengage the drive from the torque converter when the vehicle is in a stopped state),

However while Applicant's admitted prior art teaches where the method comprises a step of disengaging the clutch (**see Applicant's specification paragraph 7**), it does not specifically teach where the method comprises the steps of: detecting actuation of a vehicle brake system with a brake system sensor and issuing a braking signal with the brake system sensor that a value correlating to a strength of the actuation of the brake system; determining an input torque of the clutch with an electronic controller upon reception of the braking signal by the electronic controller, the input torque of the clutch being dependant upon a rotational speed of the hydraulic pump, a rotational speed of a turbine of the hydrodynamic torque converter and a characteristic rotational speed line of the hydrodynamic torque converter; braking the vehicle with the brake system upon reception of the braking signal in the electronic controller; associating a predetermined braking signal with the determined input torque of the clutch; comparing the value of the braking signal with a value of the predetermined braking signal; and only disengaging the clutch when the value of the braking signal matches the value of the predetermined braking signal.

Rieger teaches a method of controlling functions of a clutch in a drive-train that comprises the steps of detecting actuation of brake system with a brake system sensor which issues a braking signal having a value that correlates to a strength of the braking actuation (**see Rieger column 2, lines 39-46 and column 7, lines 4-6**); determining a

input torque of the clutch with an electronic controller upon reception of the braking signal by the electronic controller (**see Rieger column 2, lines 39-55**); braking the vehicle upon recognition of the braking signal (**see id**); associating a predetermined braking signal with the determined input torque of the clutch (**see Reiger column 3, lines 13-22 and column 4, lines 15-19**); and only disengaging the clutch when the value of the braking signal matches the value of the predetermined braking signal (**see Reiger column 3, lines 13-22 and column 4, lines 32-49. See also Rieger column 5, line 60 thru column 6, line 24 and column 6, lines 40-50. See also column 3, lines 30-35 teaching where the input shaft of the clutch is connected to the output shaft of the engine because "the rotational speed differential across the clutch can be determined from the rotational speed differential between the engine shaft and the transmission input shaft". Therefore the input torque of the clutch is directly related to the output torque of the engine which is one of the parameters in Reiger (see column 2, lines 58-61)**).

It would be obvious to one of ordinary skill in the art to modify the method in Applicant's admitted prior art with the clutch control in Rieger because this allows the clutch torque to be reduced at a high speed when there is danger of an engine stalling (**see Rieger column 2, lines 29-38**). Although the clutch in Rieger is for an automated manual shift transmission, the function of the clutch is the same as the clutch in Applicant's admitted prior art, i.e. disconnecting the driving motor from the driving wheels.

Fonkalsrud teaches a method of calculating the input torque to a transmission from the characteristics of a torque converter including: a rotational speed of the impeller to the torque converter, the rotational speed of the turbine of the torque converter and a characteristic rotational speed line of the hydrodynamic torque converter (**see Fonkalsrud column 3, lines 42-62 where a converter output torque is determined as: Converter Output Torque = Primary Torque*Torque Ratio*(Input Speed/Output Speed)^2. As admitted by Applicant, the pump used to drive the power consuming devices and the input of the torque converter are both driven by the engine. Therefore, the pump speed is the same as the input speed of the torque converter**).

It would be obvious to further modify Applicant's admitted prior art, as modified by Rieger, so that the input torque to the clutch is calculated in the manner taught in Fonkalsrud because this would provide a more accurate value of the clutch input torque than the engine torque used in Rieger.

1. Claims 31, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art with reference to Mikami et al. (US 6039673) and in view of Rieger et al. (US 7025708 B2) and further in view of Smart (US 2003/0205930 A1).

Regarding claim 31, Applicant's admitted prior art, as modified by Rieger in claim 27, does not teach where the method further comprises the step of detecting actuation of the brake system with the brake system sensor prior to braking the vehicle with a service brake.

Smart teaches a brake-by-wire system where a deceleration request is detected prior to actuating a service brake (**see Smart paragraphs 22-23**).

It would be obvious to one skilled in the art to add the function of the brake-by-wire system to the method taught in Applicant's prior art, as modified by Rieger in claim 15, because brake-by-wire systems are well known in the art (**see Smart paragraph 22**).

Regarding claim 32, Applicant's admitted prior art, as modified by Rieger in claim 27 and further modified by Smart in claim 31, teaches where the method further comprises the step of actuating the service brake when the value of the braking signal corresponds to a defined braking signal (**see Smart paragraph 23**).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this or any earlier communication from the examiner should be directed to Examiner Peter Nolan, whose telephone number is 571-270-7016. The examiner can normally be reached Monday-Friday from 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black, can be reached at 571-272-6956. The fax number for the organization to which this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Peter D Nolan/

Examiner, Art Unit 3661

12/9/2009

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661